



Monitoring Subalpine Butterflies as Climate Changes

2016 Summary of Accomplishments

Background

Future Pacific Northwest summers will be warmer and drier, snow will melt earlier, and forest fires may be more frequent. High-elevation ecosystems are especially vulnerable to warming climates because plants and animals are adapted to long winters and short summers with mild temperatures. We are monitoring butterfly abundances and plant phenology to understand how pollinators in our parks will be influenced by warming climates.

Program Objectives

Citizen scientists monitor butterfly abundance and plant phenology at ten permanent survey sites in two national parks and two national forests each summer, starting in 2011.

2016 Survey Results

- First survey of the year was June 8 at Sauk Mountain - 61 butterflies, 6 species: Anise Swallowtail, Clodius Parnassian, Western Meadow Fritillary, Sarah Orangetip, Silvery Blue, Milbert's Tortoiseshell
- Last surveys of the year were September 16 on Mazama Ridge (38 butterflies, 4 species) and Cascade Pass (19 butterflies, 4 species). The same 4 species were observed at both sites: Anna's Blue, Mormon Fritillary, Hydaspe Fritillary, and Mariposa Copper
- 7 new species were documented : Echo blue, Persius Duskywing, & Greenish Blue (Mazama Ridge), Common Alpine (Easy Pass), Cabbage White & Acmon Blue (Sunrise Rim), and Coronis Fritillary (Naches Loop)

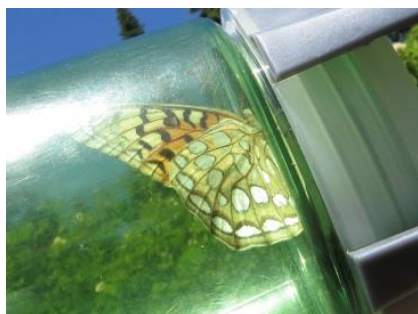


Figure 1. Coronis Fritillary, Naches Loop. Photo by Melanie Weiss.

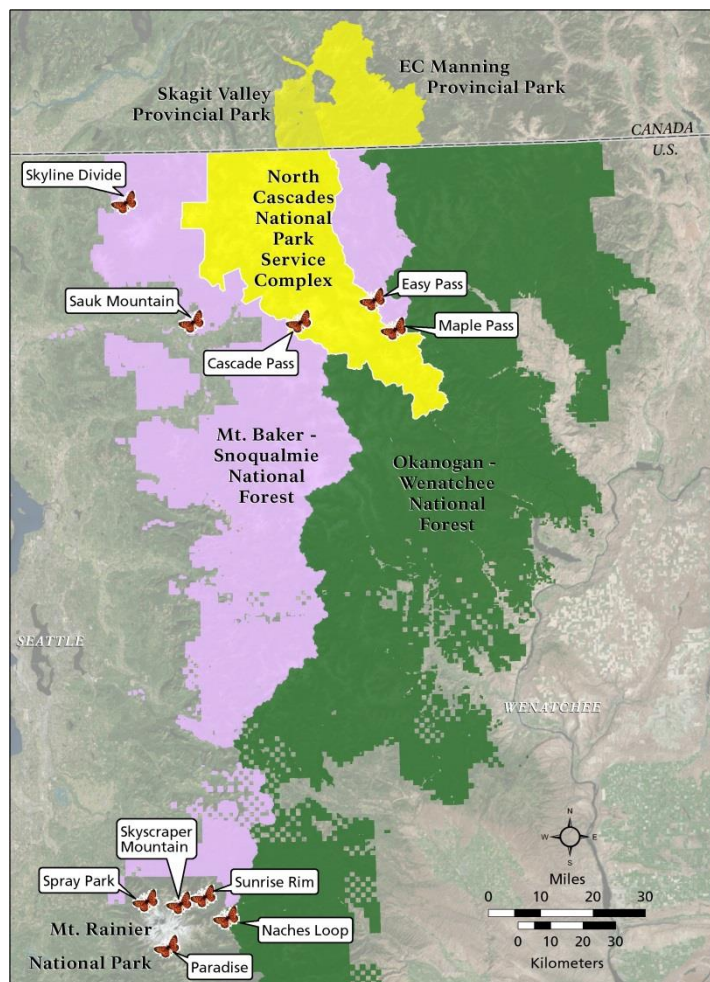


Figure 2. Map of survey sites.

Table 1. Summary of surveys completed by year.

Year	# Surveys	# Species	# Butterflies
2011	29	23	819
2012	29	21	480
2013	34	21	1,585
2014	65	30	2,519
2015	100	36	4,431
2016	82	37	3,573

Butterfly Abundance & Flight Times

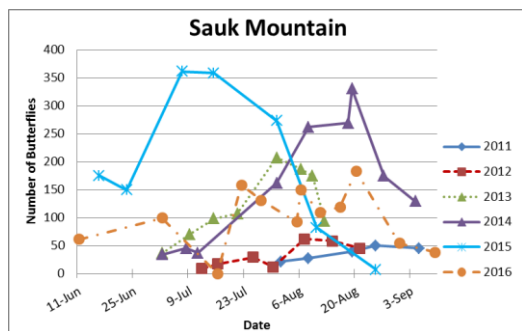


Figure 3. Sauk Mountain butterfly abundances, 2011-2016.

At almost all sites, peak abundances were lower and occurred later than in 2015 (e.g. Sauk Mountain, Figure 3, Table 2)

Anna's Blue was recorded at all 10 sites, Boisduval's Blue and Mormon Fritillary at all sites except Maple Pass

Table 2. Peak butterfly abundance by route and date for 2015 and 2016.

Site	2016 Date	#	2015 Date	#
Cascade Pass	Aug 29	116	Aug 11	111
Easy Pass	Aug 4	118	Jul 14	169
Maple Pass	Aug 3	35	Jul 14	24
Sauk Mountain	Aug 19	183	Jul 15	358
Skyline	Aug 15	67	Jul 7	125
Mazama	Aug 25	87	Jul 6	242
Naches	Aug 16	59	Jul 8	96
Skyscraper	Aug 16	58	Jul 15	99
Sunrise	Aug 16	90	Jun 30	113
Spray Park	Aug 22	44	Jul 15	72

Plant Phenology Surveys

This year we worked on refining a list of plants for each survey route. Currently we have between 14 (Spray Park) and 29 species (Easy Pass) listed for surveys at each site. Phenophase data will be analyzed during the winter of 2016-2017.



Figure 4. Mid (left) and late (right) phenophases of Bracted Lousewort.

Volunteer Involvement

This year we had 36 great volunteers! Thank you Everyone!

A few facts on our Citizen Scientists:

Most Surveys this Season

- 7 surveys - Melanie Weiss & Doug Murphy
- 6 surveys - Mary Prichard & Paul Metzner, close second

Longest Volunteers

- 6 seasons - Melanie Weiss
- 5 seasons - Ayako Okuyama-Donofree, Mike Donofree, Elena Bianco, Irene Perry, and Cathy Clark

Most Sites Surveyed

- 3 sites - Lee Wales
- 2 sites - Ayako Okuyama-Donofree & Mike Donofree, Irene & Mark Perry, Sue Casillas, Paul Metzner

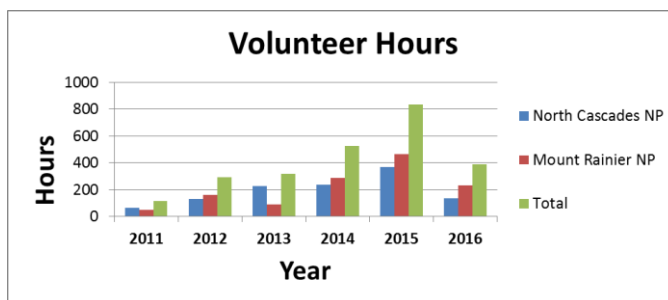


Figure 5. Volunteer hours 2011-2016.

2016 Field Crew



Figure 6. 2016 NPS field crew: Kathy Acosta, Tanner Humphries, Eddie Silahua, Michelle Wong, Regina Rochefort, Ana Casillas Brownson, Angelina Nguyen.



More Information

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